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Copy 7 of 7

14 March 1963

MEMORANDUM FOR : Deputy Director (Research)

SUBJECT : U-2 Generator Brush Failures

REFERENCE : Memo for DCI from DD/R, Dated 13 March 1963;
Same Subject []

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1. In connection with the reference, Kelly Johnson called me at 1030 a.m. 14 March to report further on additional conversations with Lear Siegler and tests run at Lockheed on the generator brush problem. At the moment the situation is best described as merky. Significant features of our conversation were as follows:

a. As of the time of the call, Kelly had not had his meeting with Union Carbide as yet. He had, however, had a series of non-productive discussions with top management of Lear Siegler on the problem, and Mr. Johnson described the situation at Lear in this matter as "a shambles". According to Kelly, Lear has been trying to claim now that they had never had Pfaffner bearings installed in the generator, despite the fact that Lockheed tore down several of the returned items and showed the Lear people at Pfaffner bearings taken therefrom. At the present in addition to the brush problem, the MRC bearings, which up to this point have not given trouble, have begun to fail, in at least one case simultaneously with complete failure of the brushes. Brush failures are occurring within ten hours of the installation of the generator, but without any pattern repeatedly, i. e., two apparently identical sets of brushes will perform completely differently under identical environmental tests.

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b. SAC apparently had another generator failure at Del Rio yesterday caused by the carbon brushes being disintegrated in a matter of several hours of flight operation, despite the fact that with the larger air scoop now used on the U-2, carbon brush temperatures are down approximately 135 degrees from their previous average of slightly 300 degrees F. Kelly claims now that Lear Siegler does not even have a proper specification on carbon brushes for this generator at all. Up to this point LAC has relied upon the "old" brushes as opposed to the new and presumably less qualified brushes installed in recent overhauls, but events of the past few days have shown in several days have shown in several cases that complete brush failure has occurred in some generators where the brushes are from both lots, that is to say, combinations of old and new; on the other hand, identical generators have run without trouble.

c. The 500 AMP generator which Kelly had hoped to quickly adapt to the U-2 from the B-57 is now expected to take three and one-half weeks to properly adapt it to the different drive speed as between the two aircraft. LAC has two of these B-57 generators and is asking to get them six more.

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2. As Kelly pointed out in connection with the combined difficulties of brushes and bearings, even a bearing like the MRC product which is rated at 8,000 RPM (as opposed to the New Departure model rated at only 4,800 RPM) will fail if the main bearing seal pops and all the grease runs out. This appears to be what is causing the most recent bearing failures again, even though the operating environment temperatures have been brought down with the new air scoop and even though the improperly qualified grease has been eliminated.

3. SUMMARY: About all that Kelly could say in summary was that as much as they feel dissatisfied with Lear Siegler performance to date, they feel obligated to try to get a fix with the present generator rather than wait the nearly thirty days for adaptation of the B-57 generator. Accordingly, they will continue to press Lear and Union Carbide for an interim solution. As a second move they intend to begin the adaptation procedure on the B-57 generator immediately so as not to lose time in the event all attempts with Lear are doomed to failure. As an additional precaution, Kelly asked that we instruct

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the Field to inspect the main bearing seal after each flight to see if it was continuing to hold the grease and, if so, were there no evidences of excessive carbon brush wear, he felt we could be reasonably certain of the generator's reliance when it passed the ten hours' mark. I asked [] to so advise [], but at the same time to caution them that this was simply an interim advisory and complete qualification of the generator would have to depend upon more conclusive testing and evaluation by Lockheed. Kelly said he would be in touch with us on Friday, 15 March, on this subject again. At this point I see no reason to confuse the issue by going into detail of this sort with the Director unless you are put to the test on operational readiness. Kelly has reached one final conclusion, however, and that is that the resolution of our generator problems does not lie with Lear Siegler in the long term.

JAMES A. CUNNINGHAM, JR.
Acting Assistant Director
(Special Activities)

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